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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,395	08/31/2001	Mark Alan Lemkin	AIMI-01833US0	3000

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EXAMINER

TAMAI, KARL I

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 04/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,395

Applicant(s)

LEMKIN, MARK ALAN

Examiner

Tamai IE Karl

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 27 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 27 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims 16-26 drawn to an invention nonelected with traverse in Paper dated 6/24/2003. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Drawings

2. The prior objection to the drawings under 37 CFR 1.83(a) is withdrawn.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the stationary and moving comb fingers formed by etching down through the substrate must be shown must be shown or the feature canceled from the claims 10-15, 27, and 29. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The amended title "MEMS COMB-FINGER ACTUATOR FOR GENERATING AND SENSING MOVEMENT RELATIVE TO A SURFACE" has been entered into the file wrapper. The requirement of a new title is withdrawn.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 10-15, 27, and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The specification does not contain a full, clear, concise, and exact written description of the stationary and moving comb fingers formed by etching down through the substrate.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. The rejection of Claims 1-4, 7, and 8 under 35 U.S.C. 102(b) over Nakagawa et al. (Nakagawa)(JP 04-343,318) is withdrawn.

9. Claims 1-4, 7-10 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated Yamada et al. (Yamada)(US 5959760). Yamada teaches a stationary electrode capable of supporting an voltage potential between the top and bottom surfaces (7-a,a', b, b') and a moving mirror comb fingers that moves when a voltage is applied to the fingers, where the moving mirror is supported by springs. The moving and stationary electrodes 7a,b,a',b' having voltages sources applied to the electrodes, which an op-amp circuit to determine the position of the moving member.

In regards to claims 10 and 27, a product by a process claim "even though the product-by process claims are limited by and defined by the process, determination of patenability is based on the product itself. The patentability of the product does not depend on its method of production. If the product in the product by process claim is the same or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process". *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966(Fed. Cir. 1985). In the instant case, the first and second combs are both part of the top layer (see figure 9b) of the substrate as required by the structure limitations of the claim.

10. Claims 1-4, 7, 8, 10, 11, 27, and 29 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Behin et al. (Behin)(US 2002/0005976). Behin teaches coplanar moving and stationary comb fingers 24, 14, where a voltage potential is applied between the layers of the stationary combs to rotate the movable combs. The voltage

potential is applied the first, second and third voltages sources 15. The electrostatic fingers effecting a force between the moving and stationary combs. Behin teaches a second set of comb fingers 90 degrees relative to the first set of fingers comb.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 5, 6, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behin et al. (Behin)(US 2002/0005976). Behin teaches every aspect of the invention except the voltage applied to the moving finger is significantly greater, than the stationary finger, such as 10 times greater. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Behin with the voltage applied to the moving finger is significantly greater, than the stationary finger, such as 10 times greater, to optimized the speed and deflection of the actuator, and because it has been held that were the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behin et al. (Behin)(US 2002/0005976) and Yamada et al. (Yamada)(US 5959760). Behin teaches every aspect of the invention except an op-amp position sensor. Yamada teaches an opt-amp position sensor. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Behin with an opt-amp position sensor circuit, as in Yamada, to synchronize the timing of applied voltages.

14. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Yamada)(US 5959760), in further view of Nakagawa et al. (Nakagawa)(JP 04-343,318). Yamada teaches a fixed voltage on a moving comb, with a voltage differential on the stationary comb. Yamada teaches every aspect of the invention except a voltage source applied across the upper and lower surfaces of the stationary comb. Nakagawa teaches a fixed voltage on a stationary comb, with a significant voltage differential (0-Vcc) on the moving comb. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Yamada with the voltage differential on the stationary combs across the stationary combs because Nakagawa teaches the voltage differential across the electrode provides low voltage, high speed actuator with a large torsional angle.

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15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Yamada)(US 5959760) and Nakagawa et al. (Nakagawa)(JP 04-343,318).

Yamada and Nakagawa teach every aspect of the invention except the voltages being 100 and 10 volts fingers. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Yamada and Nakagawa with a 100 and 10 volt differential to optimize the driving of combs, and because it has been held that were the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

16. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Yamada)(US 5959760), in further view of Miller et al. (Miller)(US 6000280).

Yamada teaches every aspect of the invention except the moving electrode being smaller than the stationary electrode. Miller teaches changing the height of the electrode increase the static deflection. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Yamada with the moving electrode being smaller than the stationary electrode, as taught by Miller, to increase the static deflection of the mover.

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17. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Yamada)(US 5959760), in further view of Miller et al. (Miller)(US 6000280).

Yamada teaches every aspect of the invention except the stationary finger being 1.5 times moving electrode. Miller teaches changing the height of the electrode increase the static deflection. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Yamada and Miller with the stationary electrode being 1.5 times the moving electrode to optimized the static deflection, and because it has been held that were the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

18. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Yamada)(US 5959760) in further view of Saif et al. (Saif)(US 5862003). Yamada teaches every aspect of the invention except the spring being 180 degrees from the comb actuator with regards to the mirror. Saif (figures 4-6) shows an actuator 180 from the springs with regards to the stage. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Yamada with the spring being 180 degrees from the comb actuator with regards to the mirror, as in Saif, to provide a highly controllable and stable actuator.

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19. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (Yamada)(US 5959760). Yamada teaches every aspect of the invention except the second set of moving electrodes being 90 degrees from the first set. Yamada teaches a second set of electrodes (figure 12) to rotate the mirror about two axis. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Yamada with the second set of electrodes to rotate the mirror about two axis.

Response to Arguments

20. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground of rejection. The Applicant's argument regarding the product by process claims 10-15, 27, and 29 is not persuasive because the specification does not support etching of the substrate to form the combs. The Applicant's argument that Yamada does not teach the moving and stationary fingers on the same plane is not persuasive because the limitation has not been claimed.

Conclusion

21. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (571) 272 - 2036.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Darren Schuberg, can be reached at (571) 272 - 2044. The facsimile number for the Group is (703) 872 - 9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karl I Tamai
PRIMARY PATENT EXAMINER
April 22, 2004

A handwritten signature in black ink, appearing to read 'Karl I Tamai', with a long, sweeping line extending upwards and to the right.

KARL TAMAI
PRIMARY EXAMINER